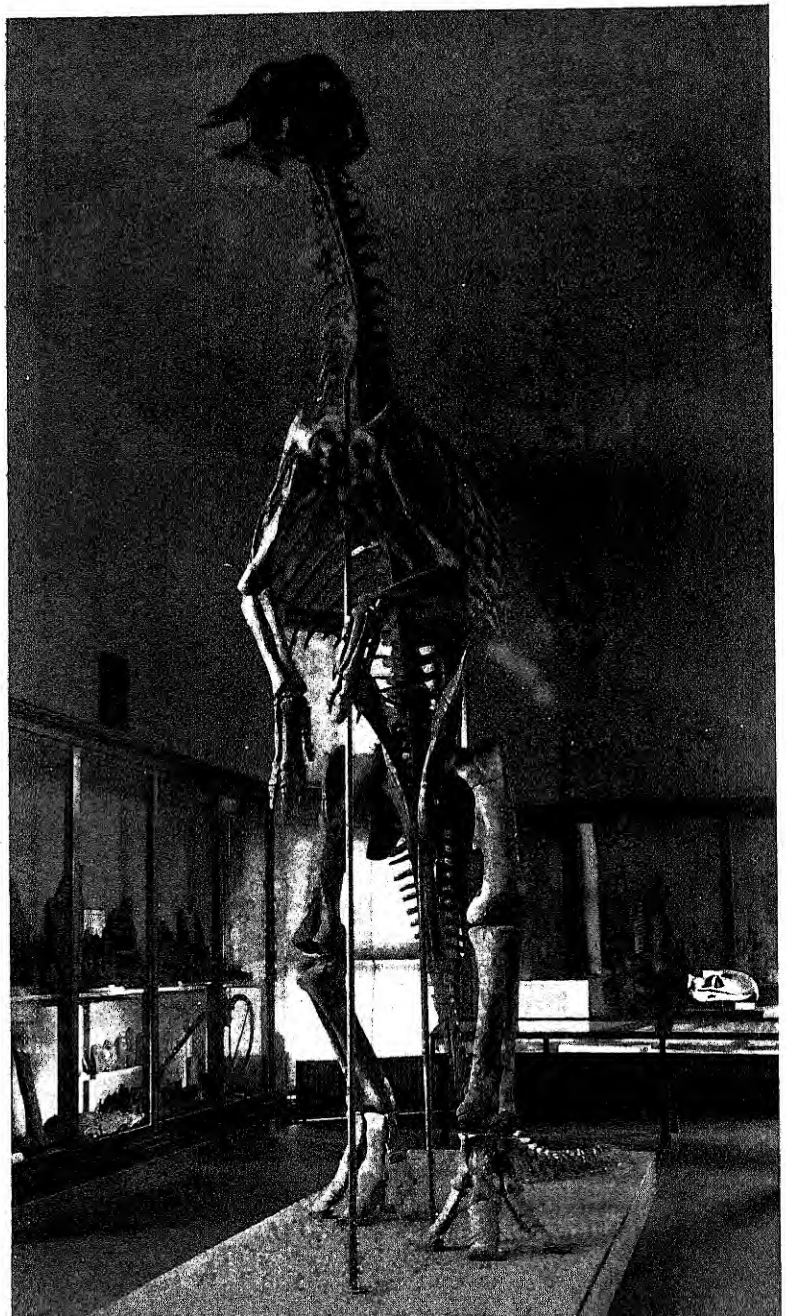


The American Museum Journal

Vol. VIII APRIL, 1908 No. 4

THE TRACHODON GROUP.

DINOSAUR remains which are complete enough to put together as articulated skeletons are rare. Among the best preserved of them are bones of members of the Trachodont family. Heretofore, it has been necessary to content ourselves with exhibiting single specimens, except in the case of Allosaurus, which has been mounted as if it were in the act of feeding upon the remains of a Brontosaur. The Museum, however, has recently acquired Trachodon material including two nearly complete skeletons, and these have been mounted together in a group, so that each represents a characteristic attitude of the living animal. The accessories consist of fossil plants belonging to the same period and suggesting the natural surroundings and the food of the animals.

This group takes us back in imagination to the Cretaceous period, more than three millions of years ago, when Trachodonts were among the most numerous of the dinosaurs. Two members of the family are represented here as feeding in the marshes that characterized the period, when one is startled by the approach of a carnivorous dinosaur, Tyrannosaurus, their enemy, and rises on tiptoe to look over the surrounding plants and determine the direction from which it is coming. The other Trachodon, unaware of danger, continues peacefully to crop the foliage. Perhaps the erect member of the group had already had unpleasant experiences with hostile beasts, for a bone of its left hind foot bears three sharp gashes which were made by the teeth of some carnivorous dinosaur.

By thus grouping the skeletons in life-like attitudes, the relation of the different bones can best be shown, but these, of course, are only two of the attitudes commonly taken by the creatures during life. Mechanical and anatomical considerations, especially the long straight shafts of the leg bones, indicate that dinosaurs walked with their limbs straight

under the body rather than in a crawling attitude with the belly close to the ground, as is common among living reptiles.

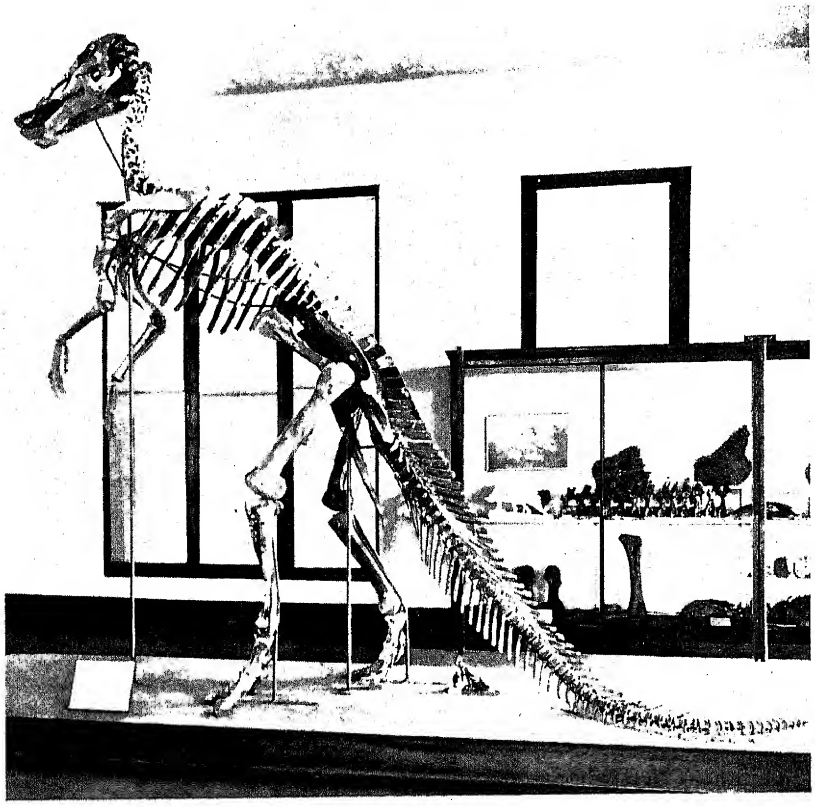
Trachodonts lived near the close of the Age of Reptiles in the Upper Cretaceous and had a wide geographical distribution, their remains having been found in New Jersey, Mississippi and Alabama, but more commonly in Wyoming, Montana and the Dakotas. A suggestion of the great antiquity of these specimens is given by the fact that since the animals died, layers of rock aggregating many thousand feet in vertical thickness have been slowly deposited along the Atlantic coast.

The bones of the erect specimen are but little crushed, and a clear conception of the proportions of the animal can best be obtained from this specimen. It will be seen that the Trachodon was shaped somewhat like a kangaroo, with short fore legs, long hind legs and a long tail. The fore limbs are reduced indeed to about one sixth the size of the hind limbs, and judging from the size and shape of the foot-bones, the front legs could not have borne much weight. They were probably used in supporting the anterior portion of the body when the creature was feeding, and in aiding it to recover an upright position. The specimen represented as feeding is posed so that the fore legs carry very little of the weight of the body. There are four toes on the front foot, but the thumb is greatly reduced, and the fifth digit, or little finger, is absent.

The hind legs are massive and have three well-developed toes ending in broad hoofs. The pelvis is lightly constructed with bones elongated like those of birds. The long, deep, compressed tail was particularly well adapted for locomotion in the water. It may also have served to balance the creature when standing erect on shore. The broad, expanded lip of bone known as the fourth trochanter, on the inner posterior face of the femur, or thigh bone, was for the attachment of powerful tail muscles similar to those that enable the crocodile to move its tail from side to side with such dexterity. This trochanter is absent from the thigh bones of land-inhabiting dinosaurs with short tails, such as *Stegosaurus* and *Triceratops*. The tail muscles were attached to the vertebræ by numerous rod-like tendons which are preserved in position as fossils on the erect skeleton. Trachodonts are thought to have been expert swimmers. Unlike other dinosaurs their remains are frequently found in rocks that were formed under sea water, probably bordering the shores but nevertheless containing typical sea shells.

The elaborate dental apparatus is such as to show clearly that

Trachodonts were strictly herbivorous creatures. The mouth was expanded to form a broad duck-like bill, which during life was covered with a horny sheath, as in birds and turtles. Each jaw is provided with from 45 to 60 vertical and from 10 to 14 horizontal rows of teeth, so that there were more than 2,000 teeth all together in both jaws.

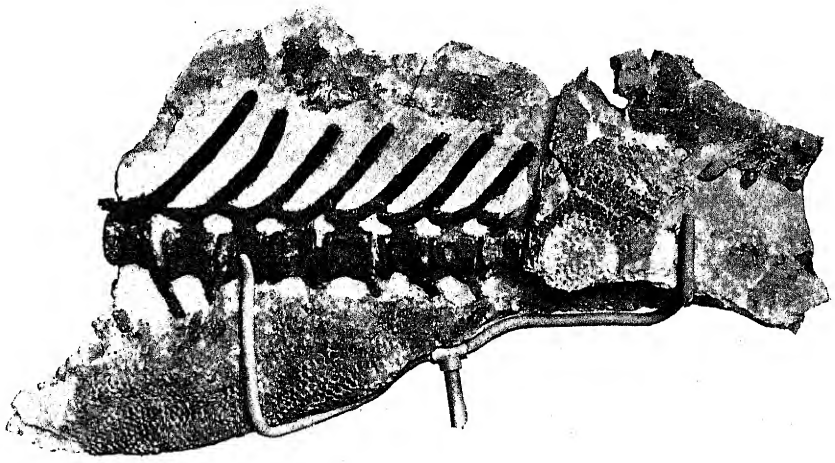


TRACHODON.
Side view of the erect specimen.

Among living saurians, or reptiles, the small South American iguana, *Amblyrhynchus*, may be compared in some respects with the Trachodons, in spite of wide difference in size. These modern saurians live in great numbers on the shores of the Galapagos Islands off the coast of Chile. They swim out to sea in shoals and feed exclusively on sea-weed which grows on the bottom at some distance from shore. The animal swims

with perfect ease and quickness by a serpentine movement of its body and flattened tail, its legs meanwhile being closely pressed to its side and motionless. This is also the method of propulsion of crocodiles when swimming.

The carnivorous or flesh-eating dinosaurs that lived on land, such as *Allosaurus* and *Tyrannosaurus*, were protected from foes by their sharp biting teeth, while the land-living herbivorous forms were provided with defensive horns, as in *Triceratops*, sharp spines as in *Stegosaurus* or were completely armored as in *Ankylosaurus*. Trachodon was not provided with horns, spines or plated armor, but it was sufficiently protected from carnivorous land forms by being able to enter and remain



TRACHODON TAIL.
Fragment preserving an impression of the skin.

in the water. Its skin was covered with small raised scales, pentagonal in form on the body and tail, where they were largest, with smaller reticulations over the joints but never overlapping as in snakes or fishes. A Trachodon skeleton was recently found with an impression of the skin surrounding the vertebræ which is so well preserved that it gives even the contour of the tail, as is shown in the illustration on this page.

During the existence of the Trachodonts, the climate of the northern part of North America was much warmer than it is at present, the plant remains indicating a climate for Wyoming and Montana similar to what now prevails in southern California. Palm leaves resembling the pal-

metto of Florida are frequently found in the same rocks with these skeletons. Here occur also such, at present, widely separated trees as the gingko, now native of China, and the *Sequoia*, native of the Pacific coast. Fruits and leaves of the fig tree are also common, but most abundant among the plant remains are the *Equisetæ*, or horsetail rushes, some species of which possibly supplied the Trachodons with food.

Impressions of the more common plants found in the rocks of this

TRACHODON AS IT APPEARED WHEN LIVING.
From a model prepared under the direction of Professor H. F. Osborn by Mr. Charles R. Knight.

period with sections of tree trunks showing the woody structure will be introduced into the group as the ground on which the skeletons stand. In the rivers and bayous of that remote period there also lived many kinds of *Unios*, or fresh-water clams, and other shells, the casts of which are frequently found with Trachodon bones. The fossil trunk of a coniferous tree was found in Wyoming which was filled with groups of wood-boring shells similar to the living Teredo. These also will be introduced in the groundwork.

The skeleton mounted in a feeding posture was one of the principal specimens in the Cope Collection, which, through the generosity of the late President Jesup, was purchased and given to the American Museum in 1899. It was found near the Moreau River, north of the Black Hills, South Dakota, in 1882, by Dr. J. L. Wortman and Mr. R. S. Hill, collectors for Professor Cope. The erect skeleton came from Crooked Creek, Central Montana, and was found by a ranchman, Mr. Oscar Hunter, while riding through the bad lands with a companion in 1904. The specimen was partly exposed, with backbone and ribs united in position. The parts that were weathered out are much lighter in color than the other bones. Their large size caused some discussion between the ranchmen, and to settle the question, Mr. Hunter dismounted and kicked off all the tops of the vertebræ and rib-heads above ground thereby proving by their brittle nature that they were stone and not buffalo bones as the other man contended. The proof was certainly conclusive, but it was extremely exasperating to the subsequent collectors. Another ranchman, Mr. Alfred Sensiba, heard of the find and knowing that it was valuable, "traded" Mr. Hunter a six-shooter for his interest in it. The specimen was purchased from Messrs. Sensiba Brothers and excavated by the American Museum in 1906.

BARNUM BROWN.

THE HEAD OF THE AFRICAN ELEPHANT.

The illustration on the opposite page shows the head of a large African elephant, as it has been mounted by Mr. Herbert Lang at the Museum. The animal, which was of unusual size, was killed by Mr. Richard Tjäder upon the expedition into German East Africa which he undertook in 1906 for the American Museum. When alive, this elephant stood 10 feet 4 inches high at the shoulders and was 22 feet 8 inches long. The tusks are 6 feet 4 inches long and weigh 160 pounds. The specimen has been installed in the East Corridor, second floor (Hall No. 205.) Brief accounts of the Tjäder expedition were published in the JOURNAL for October, 1906, and April, 1907.